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ABSTRACT

The purpose of this study is twofold: (1) to examine teacher trainees' knowledge of teaching prior to training and its relationship to performance in the training program; and (2) to determine if there is a set of identifiable domain-specific knowledge related to course performance. Since trainees enter teacher training programs with prior knowledge and beliefs about teaching and learning, their learning and practice will be influenced by such pre-existing knowledge. This paper reports an initial attempt to explore prior domain-specific knowledge of high and low performance trainees. It was hypothesized that trainees' preexisting knowledge in teaching helps performance in course work. Approximately 300 trainees in a secondary school program in Singapore identified one positive and one negative critical incident after viewing a videotaped lesson. Findings suggest: high performance trainees are more critical than low performance trainees with respect to teachers' planning; lower performance trainees are more impressed by teaching aids, interaction, and communication in the classroom; relationships of trainees' comments on the videotaped lesson as a measure of preexisting domain-specific knowledge and their training performance provide insights into the prediction of teaching performance and the selection of trainees. (LL)

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PRE-EXISTING DOMAIN-SPECIFIC KNOWLEDGE AS PRESAGE VARIABLE FOR
THE PREDICTION OF TRAINEES' PERFORMANCE

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Abstract -- This paper reports an initial attempt to explore the differential prior domain-specific knowledge of high- and low-performance trainees. About three hundred trainees in the secondary school programme identified one positive and one negative critical incident after viewing a video taped lesson. Responses reveal a variety of knowledge about teachers and teaching. Is there a set of identifiable domain-specific knowledge that is related to course performance? This study attempts to establish this relationship. Results provide insights into the prediction of teaching performance and the selection of trainees.

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It is evident that many people are concerned with selection of good teachers--trainees who will perform well during training and subsequently teach effectively in schools. Researchers of teacher education study presage variables in the hope of relating teacher characteristics with pupil performance. Variables such as gender, age, academic performance, personality, aptitude, attitude, experience as relief teacher or tutor, responsibilities held in the church or at school as well as socio-economic status have been studied as predictors of effective teaching or performance in teaching programmes. Findings have been both inconsistent and inconclusive.

Many studies have shown the relative importance of domain-specific knowledge on the acquisition of domain-related information (Chiesi, Spilich & Voss, 1977; Schneider, Körkel & Weinert, 1989) and memory performance (Recht & Leslie, 1988; Walker, 1987) such as in reading and comprehension. In addition, domain-specific knowledge can compensate for low overall aptitude on domain-related cognitive tasks (Schneider et al., 1987), yet very few studies and practices have included knowledge in teaching before training (pre-existing domain-specific knowledge of teaching) as a predictor variable for performance in teacher education or as a criterion for selection. I believe that with such prior knowledge in teaching, beginning teachers will learn and understand faster and with competence the scientific basis of the art of teaching.

To date, entry behaviour of teacher trainees has been represented academically or cognitively by the "O" or "A" level achievement or their performance in their undergraduate studies. Rarely is knowledge in teaching assessed for selection.

Questions asked at interviews but have not been measured systematically are "Why do you want to be a teacher?" to assess their motivation and "What educational journals have you read?" to gauge their attitude and interest towards teaching. Whether applicants have any inkling of what good or bad teaching is and whether this knowledge will relate to their performance in their course work and eventually in teaching at school will be an interesting finding.

One would presume that whatever the trainees perceive and comment about good and bad teaching would have internalized and revealed in their subsequent teaching behaviour. In other words, those who, at the outset of their profession, are perceptive of good and poor teaching, or are aware of the strengths and weaknesses in the process of teaching would readily avoid the pitfalls of wrong teaching or malpractice, and confidently teach, in theory or in practice, with effectiveness and efficiency.

This study examines trainees' differential knowledge of teaching before training and its relationship with their performance in the training programme. Prior knowledge is measured indirectly by their written comments on the taped lesson, categorised and analysed based on trainees' course performance. The study attempts to answer three questions:--

(a) What kind of pre-existing knowledge of teaching do the trainees have? (b) How different are the high performance trainees from the low performance trainees in their pre-existing domain-specific knowledge? (c) How much is performance related to prior knowledge?

Method

Before the trainees had formal lectures, the 1989 intake of

Diploma in Education trainees (prepared to teach in secondary schools) were shown a video tape on teaching (the video functions as a stimulus to elicit responses). After viewing for 10 minutes on the actual teaching of the taped lesson, the trainees were to provide two critical incidents, one positive aspect and one negative aspect of the lesson observed. They were to write freely on a commendable feature of the lesson and a feature which needs improvement. Their responses were coded according to the variables--presage, process and product--in the teaching processes as classified by Mitzel (1960). Patterns of responses were identified, and subsequently compared between two groups of trainees with different performance levels.

Analysis

Only 240 of the 301 trainees had complete data on their submission of responses and course performance. Cases with missing data such as identity number, or examination scores were excluded in the analysis. Simple content analyses were carried out to answer the questions posed. Responses were (a) tabulated first to see the distribution of the kinds of knowledge the trainees had about teaching before training, and (b) compared between the high performance (HP) and the low performance (LP) groups of trainees based on their performance at the end of the one-year training programme.

For measures of performance, I initially looked at trainees' performance in their teaching practice (TP), their theory examination score (PEPE), and their overall programme aggregate points (AGGPT). However, the latter is the total performance of the various courses such as Curriculum Studies, Use of English in Teaching and Moral Education, which may or may not be directly

related to the acquisition of information, or memory performance in the art of teaching. As such, AGGPT was excluded in the analysis.

Since previous studies have demonstrated that domain-specific knowledge facilitates the acquisition of the domain-related knowledge, I hypothesize that trainees' pre-existing knowledge in teaching helps their performance in their course work. The assumption is that those who do well will have domain-specific knowledge different from those who do poorly.

If prior knowledge about teaching facilitates the performance of actual teaching in the classroom, it will be revealed in TP. If pre-existing domain-specific knowledge enhances the acquisition of domain-related knowledge and subsequently in the recall of facts and principles of teaching, it will be evidenced in PEPE. However, it is not clear whether prior knowledge enhances practical performance or theoretical achievement in this case. Hence, it would seem reasonable to compare the trainees who are good in both performance with those who are not good in either. Trainees who fall in the top third of TP as well as the top third of PEPE are classified as high performance (HP) and those who fall in the lower third of TP and PEPE form the low performance (LP) group. These two groups of trainees would be compared on their responses, an indication of their entry domain-specific knowledge.

Results and Discussion

As expected, trainees come with prior knowledge about teachers and teaching. Their comments on the video-taped lesson show varieties of good teaching and bad teaching resulted from (a) the teacher characteristics such as personality, voice,

preparedness and her knowledge in the subject; (b) the teaching techniques used such as teaching aids, forming discussion groups and questioning skills; and (c) the students' attention, enthusiasm, involvement, and their spontaneity to questions and activities.

Distribution of responses in Table 1 shows that for positive critical incidents (+) the lesson feature is commended significantly more frequently than the teacher feature ($\chi^2 = 11.36$, 1 df, $p < .005$). On the other hand, for a negative

[INSERT TABLE 1 ABOUT HERE]

critical incident (-), trainees mentioned teacher significantly more than lesson as a feature that needs to be improved ($\chi^2 = 10.68$, 1 df, $p < .005$). This reveals a common phenomenon: teachers tend to be blamed for anything that is "not so right" in the teaching learning process, but when things go "well," they are less often given the credit.

It is worthy to note too that only 1.67% of all the critical incidents related to the student feature. We might like to infer then that before training, the trainees have little awareness of or concern about the product variable--the student--in the teaching process. Hence, teacher educators should caution the trainees and emphasise that besides knowing WHAT to teach and HOW to teach, they must know and we, the teacher educators, must stress WHOM they teach. This supports the request for psychology and development of children and adolescents as an important and major component in the programme for teacher-trainees (Chua, 1990).

Since prior knowledge is expected to have an effect on future performance, a further breakdown of the features into aspects in relation to performance should reveal some interesting patterns. Examples of aspects of features are as follows:

Reflexive

Teacher: Tone employed and manner of eliciting responses are not appropriate to the level she was teaching (-)
Lesson: Fun lesson (+)

Planning/Procedure

Teacher: Going round the class to ensure students get on with discussion (+)
Lesson: Chorus answer (-)
Student: Pupils copying while she was reading from transparency(-)

Material/Visuals

Teacher: She brings packages to classroom, therefore there is visual impact (+)
Lesson: A good show of several packaging (+)

Introduction/Instruction

Teacher: Should reduce number of questions which require chorus answers (-)
Lesson: Clear delivery of lesson (+)

Communication/Interaction

Teacher: She pauses for students to take down notes (+)
Lesson: Definition of packaging too wordy (-)
Student: Students busy copying (-)

Note: (+) a commendable feature; (-) a feature which needs improvement

Comparisons of responses of HP (N=41) and LP (N=47) trainees suggest similarities as well as differences in their pre-existing domain-specific knowledge between these two groups. Table 2 shows similar proportions of HP and LP trainees commending or

[INSERT TABLE 2 ABOUT HERE]

criticizing the teacher, the lesson or the student feature. On the whole, more positive comments were made on lessons than on teachers, and for features that need improvement, various aspects of the teacher were more frequently mentioned.

Of all the positive critical incidents, the most frequently cited aspect by the HP and LP was "Materials/Visuals" followed by "Planning/Procedures." On the other hand, the aspect that HP and LP trainees mentioned most often as needing improvement was "Planning/ Procedures" followed by "Interaction/Communication."

The responses displayed in Table 2 indicate that 11% more HP than LP trainees were appreciative of the Material/Visuals used, while 12% more LP than HP were impressed by the teacher's Planning/Procedure. On the negative critical incidents, the HP trainees appeared to be more critical of the teacher's planning. Almost three times as many HP as LP trainees suggested that the teacher should improve her Planning/Procedure of her lesson. Although HP trainees commended the use of Material/Visuals in the lesson, more than half of all the HP trainees, compared to 30% of the LP trainees, indicated a need for Planning/Procedure to be improved. Of the HP responses, more than a third of trainees suggested that the teacher should improve her planning and procedure of the lesson. On the other hand, the LP trainees differ from the HP in viewing the Interaction/Communication aspect of the teaching episode. More than a third of the LP trainees demanded better Interaction/Communication in the class while only 12% of the HP find such aspect needing improvement. The LP trainees demanded in particular that the teacher should improve in this aspect of her teaching.

On all other aspects of the various features, such as,

Introduction/Instruction, the differences between HP and LP trainees are negligible. This result could be due to learning, the effectiveness of the programme or the homogeneity of the group of trainees in terms of their cognitive maturity, interest and motivation to learn to teach.

Summary

The fact that trainees enter teacher training programme with prior knowledge and beliefs about teaching and learning, their learning and practice will be influenced one way or other by such pre-existing domain-specific knowledge. It seems sensible therefore to explore the relations of this knowledge with their performance in the training programme.

The present study compares the entry domain-specific knowledge of HP with LP teacher trainees. The results show that HP trainees are generally similar to the LP trainees in their comments. More trainees from each group commended on the lesson than on the teacher feature. When commenting on the features which need improvement, more criticisms were associated with the teacher than on the lesson.

One obvious difference between the two performance groups is noted. The HP trainees are more critical than the LP trainees on teachers' planning. While they show a great appreciation of the material and teaching aids used in the lesson, the HP group also suggested teachers to improve on their planning/procedure. We may infer that more HP might have internalized their knowledge and beliefs in their act of teaching. They might have been more demanding of themselves in terms of planning and executing a lesson incorporating visuals and other teaching materials, and therefore show up in their performance.

On the other hand, the LP are impressed by the teaching aids and are more particular about Interaction/Communication in the classroom. They do not seem to have placed a heavy responsibility on the teacher's planning and procedures. They might be more prepared in their materials and teaching aids and are more ready to demonstrate active involvement verbally and socially with the students. A follow-up analysis of the comments of the supervisors on these trainees will confirm such findings.

The findings of the relationships of the trainees' comments on the video-taped lesson as a measure of pre-existing domain-specific knowledge and their training performance provide insights into the prediction of teaching performance and the selection of trainees. In addition, prior domain-specific knowledge of trainees adds further information on trainees' beliefs, preferences and aptitude for teaching. Hence, pre-existing domain-specific knowledge in teaching seems to be a reasonable predictor to be considered when studying good performance as measured by practical and theoretical performance in the programme. However, it is too soon to conclude that such knowledge should be included as a selection criterion for teacher training.

Despite a difference found between the HP and LP, the difference is not too pronounced. This could be due to the difficulty of coding and scoring open-ended responses besides other reasons mentioned previously. It would be more practical to design an instrument to measure domain-related knowledge for ease of implementation and further investigation.

An instrument measuring knowledge in teaching for selection purpose would need to cover also all the professional competence

such as those suggested by Ornstein and Levine (1981). In addition, attitudes and personalities as pointed out by Soh (1990) would form an adequate battery of tests to help select the right calibre of future teachers.

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Table 1. Distribution of response (%) of critical incidents

Critical incidents	Features			χ^2
	Teacher	Lesson	Student	
Commendable (+)	93 (38.75)	145 (60.42)	2 (0.83)	130.97*
Need Improvement (-)	142 (59.17)	92 (38.33)	6 (2.50)	118.30*

Note: * $p < .005$ (2 df)

Table 2. Breakdown of responses (%) by features, aspects and combined performance on TP and PEPE

Aspects	Features						Total	
	Teacher		Lesson		Student			
	HP	LP	HP	LP	HP	LP	HP	LP
Reflexive								
(+)	5	2	0	0	0	0	5	2
(-)	10	10	0	0	0	0	10	10
Planning/Procedure								
(+)	15	23	17	19	0	0	32	43
(-)	37	13	17	15	2	2	56	30
Material/Visuals								
(+)	10	11	39	28	0	0	49	38
(-)	5	6	5	6	0	0	10	13
Introduction/Instruction								
(+)	2	0	7	9	0	0	10	9
(-)	5	6	7	9	0	0	12	15
Interaction/Communication								
(+)	2	2	2	6	0	0	5	9
(-)	10	23	0	11	2	0	12	34
TOTAL								
(+)	34	38	66	62	0	0		
(-)	66	57	29	40	5	2		

Note: (+) commendable features; (-) features need improvement